



Naval Open Architecture OA Industry Day



14 February 2006

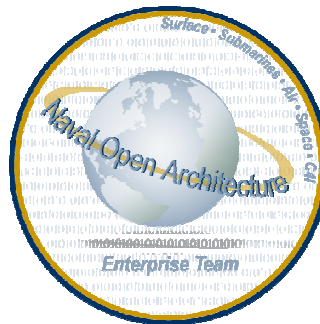
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**Captain James Shannon, USN
Program Manager, Naval Open Architecture
PEO IWS**



***Welcome to the Naval Open Architecture (OA)
Industry Day! It has been one year since our last
Industry Day and we have much to share with you on
the progress of our initiative. We have incorporated
your comments and suggestions from last year's
event into our agenda today.***

***Collaboration and outreach with Industry is key to
our OA Transformation success. Your participation
is welcomed!***





Today's Agenda



TOPIC / DISCUSSION	SPEAKERS	TIME
Opening Remarks	John Burrow	0900 - 0915
Status of Naval Open Architecture (OA)	CAPT Shannon	0915 - 1015
Morning Break		1015 - 1030
OA in the Business Environment		
□ Increasing Competition in Acquisition Strategies	Nick Mirales	1030 - 1045
□ Data Rights in Acquisition Strategies	Art Samora	1045 - 1100
□ OA Award Fee/Award Term Incentives	Robert Jackson	1100 - 1115
□ Changes in OA Contract Language	Rick Goff	1115 - 1130
□ Peer Reviews / Integrated Product Teams	John Stapleton	1130 - 1145
Questions for Business Panel Speakers		1145 - 1215
Aligning Technical Standards	Gary Minor	1215 - 1230
Questions & Wrap Up	CAPT Shannon	1230 - 1245



The intent of my presentation is to provide an update on our OA Enterprise initiative and discuss open business practices

PART I: Overview on the OA Initiative

- ☐ OA Enterprise Team (OAET)
- ☐ OA Strategy
- ☐ OA Transformation Roadmap
- ☐ OA Measures
- ☐ Benefits of OA

PART II: Assessing Your Program

- ☐ How do you know your program is truly open?



PART I: Overview of the OA Initiative



Navy leadership is under continued pressure to control the rising costs of weapon systems and platforms...

“Among the greatest risks we face is the spiraling cost of procurement for modern military systems, and shipbuilding is no exception. Shipbuilding cost increases have grown beyond our ability to control as compared to decades prior.”

— Former CNO, ADM Clark, Statement Before the Senate Armed Services Committee, 10 February 2005

“The Committee is concerned over the affordability of the Navy’s future shipbuilding program. The Committee encourages the Navy to redouble its efforts to lower costs for ship classes on the drawing boards, to provide a more affordable plan for the future.”

- Report of the Committee on the DOD Appropriations Bill, 2006, 10 June 2005

“Cost increases incurred while developing new weapon systems mean DOD cannot produce as many of those weapons as intended nor can it be relied on to deliver to the warfighter when promised. We must either make tough decisions now to increase the chances for programs to be executable within fiscal realities or brace ourselves for more draconian decisions later driven by those fiscal realities.”

- DOD Acquisition Outcomes, A Case for Change, Statement of Katherine V. Schinasi, Managing Acquisition and Sourcing Management, GAO, 15 Nov 2005

...and meet the needs of the warfighter



Implementation of open architecture across the Navy, is and will remain, a key tenet of transformation...

Business Principles

- Increased **access** to technologies and products supported by many suppliers
- Integration and use of commercial products from multiple sources both in the initial design and in future enhancements
- Use of integrated product teams and peer reviews
- Software re-use
- Increased competition
- OA language in legacy and new contracts



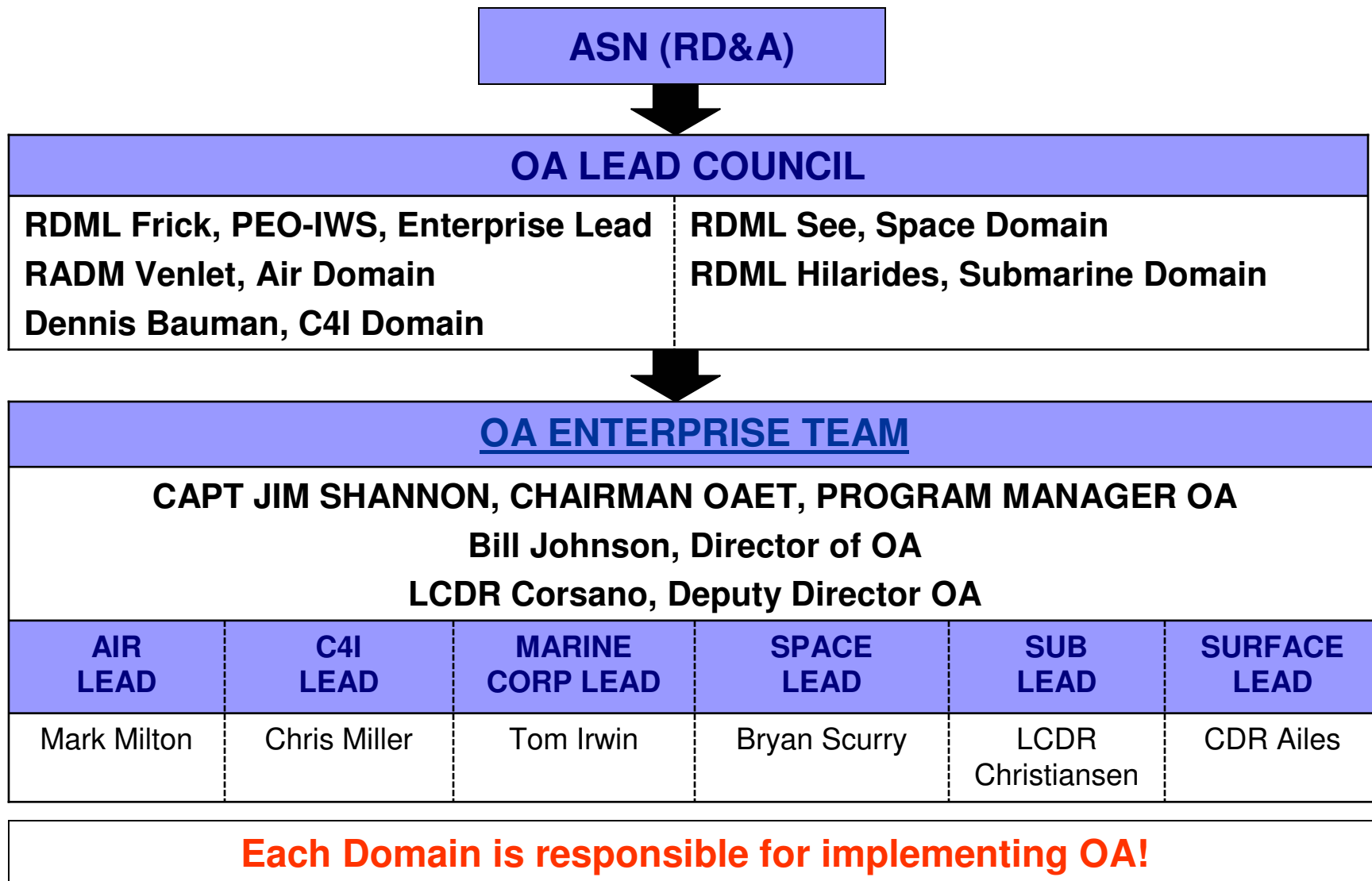
Technical Principles

- Development of modular architectures to allow for affordable interoperability
- Flexible and robust system designs to accommodate for changing technology and requirements
- Defined and published system and component interfaces
- Widely adopted industry standards
- Spiral developments to enable technology insertion as commercial products mature and new products become available

...that will help drive costs down while increasing capabilities



In August 2004, leadership established the Naval Open Architecture Enterprise Team to drive the overall OA strategy





In developing the OA strategy, it is important to understand where we are today...

Today's Environment:

■ Business

- ☐ Continuously challenged with budgetary decisions
- ☐ Inflexible acquisition strategies that “lock the Navy in”
- ☐ Limited competition that impede innovation
- ☐ Procure systems that are not affordable in production and modernization
- ☐ Procure systems for similar capabilities across the enterprise
- ☐ Limited software reuse across programs or domains
- ☐ Limited access and sharing of data across programs or domains
- ☐ Few enterprise processes to foster integration among programs and domains

■ Technical

- ☐ Incompatible systems that are not interoperable
- ☐ Monolithic or closed systems that are not rapidly or economically upgradeable
- ☐ Closed systems that cannot leverage advances in technology
- ☐ Special use code and system modules that cannot be reused across the Navy



...and where we want to go

Future Environment:

■ Business

- Enterprise-wide plans based on cost/capability analysis of programs that address capability, affordability and stabilization
- Flexible acquisition strategies and contracts that enable the Navy to reuse software, easily upgrade systems and share data among the enterprise
- Streamlined investments in similar capabilities
- Increased competition to foster innovation and leverage tech refreshes
- Established enterprise processes and governance to foster integration

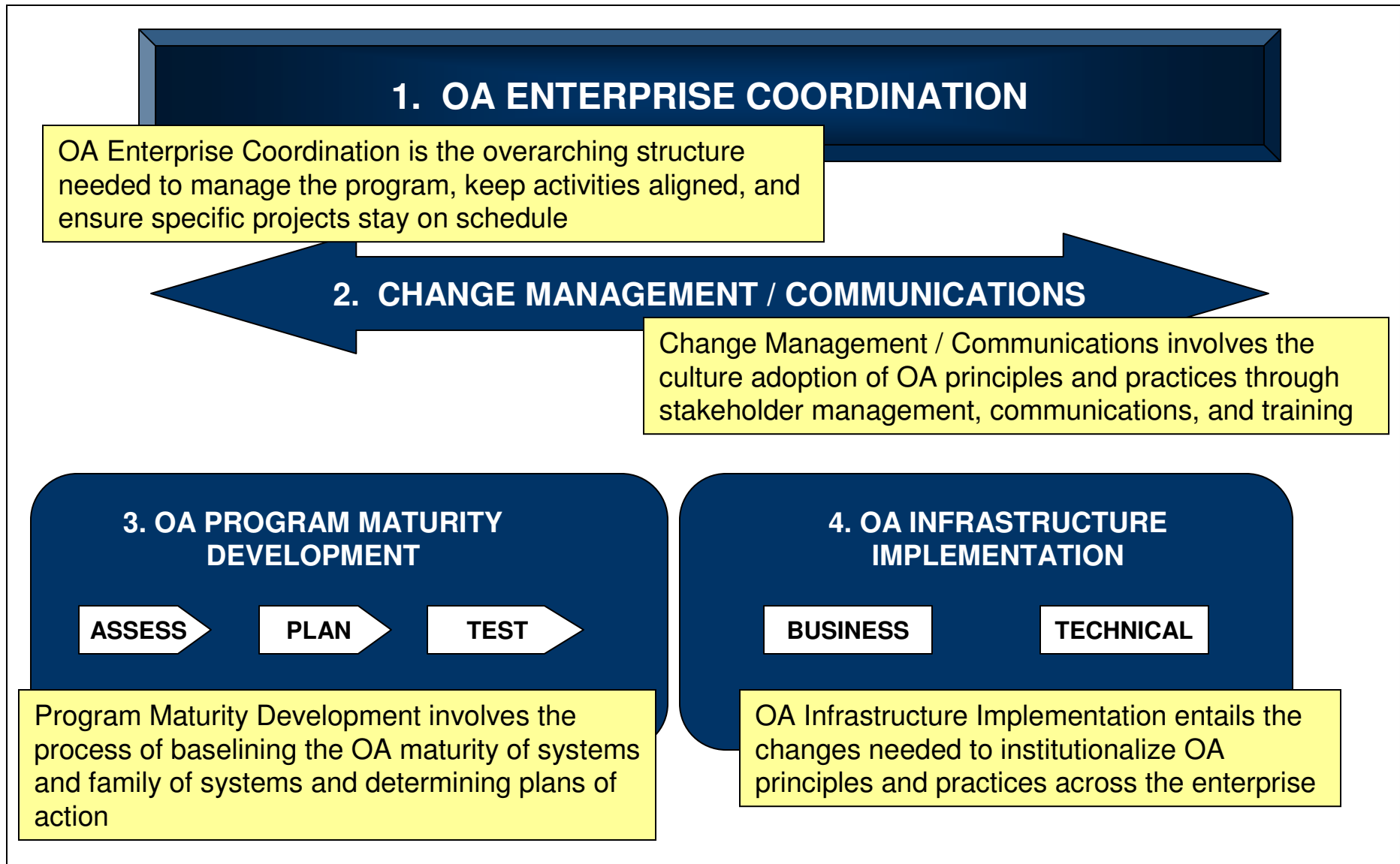
■ Technical

- Layered and modular open architectures that address portability, maintainability, interoperability, upgradeability and long-term supportability
- Modular, open designs consisting of components that are self-contained elements with well-defined interfaces
- Maximum use of commercial standards and commodity COTS products
- Continuously conform with Information Assurance (IA) requirements and monitor technology developments for IA improvements

The driving energy for OA is competition!



The OA Roadmap is our plan for reaching our end-state





Component 1 involves coordinating the transformation across the Naval Enterprise and with other services

1. OA ENTERPRISE COORDINATION

FY 06 ACTIVITIES

1.1 Execute OA Strategy

- Execute ASN (RD&A) OA vision
- Execute OPNAV OA requirements
- Execute OA EXCOMM Action Items
- Build FY06 Master Integrated Plan

1.2 Support ASN (RD&A) / OA Lead Council

- Support OA EXCOMM Meetings
- Submit Monthly OA Metrics/ Reports

1.3 Manage OA Enterprise Team (OAET)

- Conduct OAET Monthly Meetings
- Conduct Quarterly Program Reviews
- Manage OAET Integrated Workplan
- Manage FY 06 OA Budget
- Manage OAET Risk Plan

1.4 Coordinate OA Initiative with FORCEnet

- Attend FORCEnet EXCOMM Meetings
- Participate in C4I Virtual Syscom
- Align tasks, where applicable

1.5 Coordinate Naval OA Initiative with Other Services

- Coordinate with OSD, OSJTF
- Coordinate with Marine Corps
- Coordinate with Army
- Coordinate with Air Force



Component 2 includes managing change and communications with our stakeholders

2. CHANGE MANAGEMENT / COMMUNICATIONS

FY06 ACTIVITIES

2.1 Manage OAET Stakeholder Plan

- Update Stakeholder Plan
- Conduct Assessments
- Develop Mitigating Action Plans
- Execute Action Plans

2.2 Manage Ongoing Communications

- OA Briefs
- OA Precepts
- OA Quick Successes
- [Acc.dau.mil/oa website](http://Acc.dau.mil/oa)
- Correspondence
- Communications Plan

2.3 Manage Ongoing Outreach Efforts

- OA Industry Days
- OA Symposiums
- OA Road Shows
- Conferences
- Industry Consortia

2.4 Execute OA Enterprise Education and Training Master Plan

- Develop / field curricula for NPS & DAU
- Develop Continuous Learning modules / Workforce Awareness programs



Component 3 entails assessing the openness of programs, updating programs of record, and testing alternatives

3. OA PROGRAM MATURITY DEVELOPMENT

ASSESS

PLAN

TEST

FY 06 ACTIVITIES

3.1 Maintain analytical tools to assess programs

3.2 Conduct OA Program Assessments

3.3 Adjudicate Results of OA Assessments

3.4 Determine Business and Technical Alternatives

3.5 [Identify Enterprise Components](#) for Re-Use

3.6 Prepare POM Issue Papers and/or Business Case (s)

- ☐ Costs / Benefits
- ☐ Risk Assessment

3.7 Update Program of Record

- ☐ Adjust funding to support plan

3.8 [Test OA Technical Alternatives](#) for Risk Reduction

- ☐ Feasibility Testing
- ☐ Developmental Testing



Component 4 requires changing the business and technical landscape to support the implementation of OA

4. OA INFRASTRUCTURE IMPLEMENTATION

BUSINESS

TECHNICAL

BUSINESS

- 4.1 [Assess prime integrator vs. end-to-end developer roles](#)
- 4.2 Develop [enterprise OA contract language](#)
- 4.3 Establish process for conducting data rights requirements analysis
- 4.4 Develop framework for OA contract incentives
- 4.5 Develop OA Award fee criteria

TECHNICAL

- 4.6 Develop [OA Enterprise Component Library](#)
 - ☐ Inventory existing repositories
 - ☐ Develop ConOps and CM processes
 - ☐ Define data structures and technical detail
 - ☐ Identify OA Artifacts
 - ☐ Build, deploy and populate repository and toolset
- 4.7 Align Domain standards
- 4.8 Align standards to DISR



The focus of today's presentations





Successful implementation of OA requires sound measures to monitor and gauge success

ILLUSTRATIVE

- Program assessment metrics using OA Model and OA Tool
- Decreased cycle time to deliver warfighting capabilities (time to market)
- Cost avoidance from software re-use and use of commodity COTS
- Reduction of warfare system baselines
- Streamlined investments for similar capabilities, system upgrades, test and evaluation

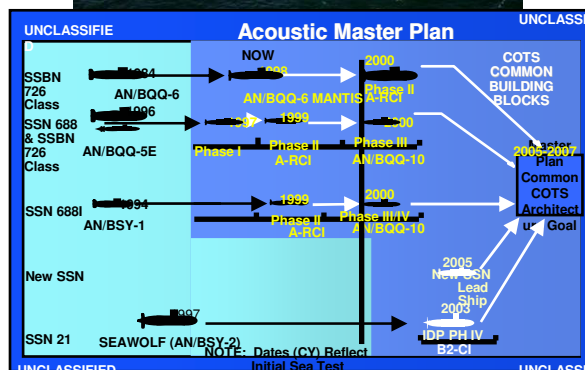


Implementation of OA has been proven by Submarines with the Acoustic Rapid COTS Insertion program

SSN-21 Submarine



Issue: In the mid-1990s, the Navy discovered that the U.S. submarine fleet's acoustic advantage over new Russian submarines was eroding. This was particularly alarming because it occurred at a time when resources available for upgrading the fleet in the traditional manner were diminishing. A creative solution had to be found --one that did not require an inordinate amount of time and money but that could still achieve the desired result.



Solution: Through new acquisition and management processes, the Submarine Acoustic-Rapid Commercial-Off-the-Shelf Insertion program, enabled the Navy to rapidly insert new technologies. The result was a **seven-fold increase in submarine towed array sensor performance** (towed array sensors are submarine listening devices towed from surface ships), and a **60-fold decrease in real processing costs**.



Virginia Class Submarine

Key Outputs

- Increased capabilities
- Reduction in processing costs
- Exploitation of new technologies
- Use of SBIRs
- Increased vendor competition
- Increased interoperability
- Tech refresh cycles every 2 years



Implementation of OA will yield many benefits to the Navy as demonstrated by the ASW community

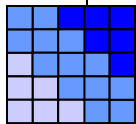
- **Performance**
 - Best of breed applications through continuous competition
 - Increased ability to respond to warfighter capability gaps and/or priorities
- **Schedule**
 - Timely system integration of OA compliant spiral software upgrade s
 - Rapid update deliveries driven by user operational cycles
- **Cost avoidance mechanisms**
 - Software – develop once, use often, upgrade as required
 - Hardware – use high volume COTS products at optimum price points
 - Training systems use same tactical applications and COTS hardware
 - Design for Maintenance Free Operating Periods
 - Consolidated Development and Operational Testing for reused applications
- **Risk reduction**
 - Field new applications only when mature
 - Don't force the last ounce of performance



PART II: Assessing Your Program



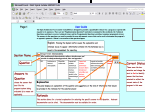
The Navy has developed the OA Assessment Model and OA Assessment Tool to assess the current “open state” of programs



OA Assessment Model (OAAM)

Official Release (V1.0) – Mar 8, 2005

- Application – PowerPoint
- Overview – Graphical depiction with business and technical characteristics
 - Bus Characteristics - 23
 - Tech Characteristics - 27
- Purpose – Concisely depict a program's openness on the 5 x 5 matrix model



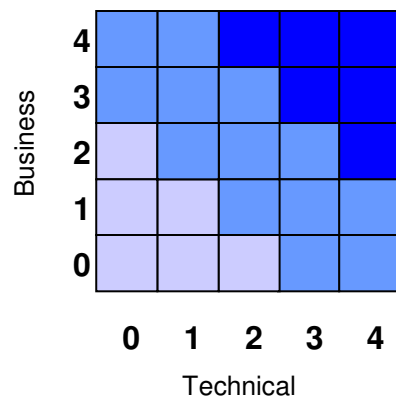
OA Assessment Tool (OAAT)

- Official Release (V1.0) – Dec 8, 2005
- Application – Excel
- Overview – Automated tool comprised of business and technical questions
 - Bus Questions - 30
 - Tech Questions - 18
- Purpose – Analyze a program's openness according to the user's response
- Directly linked to the Modular Open Systems Approach PART



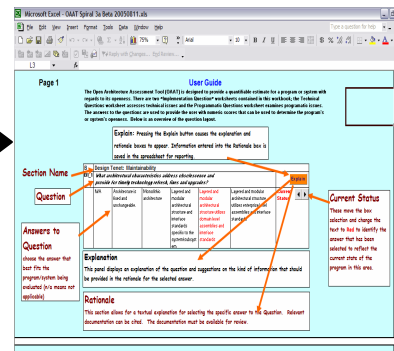
Collectively, these tools assist Program Managers in determining alternatives to increase OA maturity of programs

OA Assessment Model



- Graphical depiction of the current OA maturity state
- Identifies progression towards openness

OA Assessment Tool

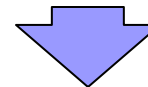


- Set of business and technical questions to help PMs understand how to become more open
- Official Version 1.0 released December 08 2005

Where is my program today?

What are the alternatives for advancing towards OA?

Is a business case needed?



BCA Template

TABLE OF CONTENTS	
EXECUTIVE SUMMARY	4
BACKGROUND	4
PROGRAM DESCRIPTION	4
Why is this investment important?	4
What will the investment in OA conversion do for the Navy?	4
How much of an investment is required?	4
INTRODUCTION	5
I.1 PROGRAM OBJECTIVES	5
I.2 BACKGROUND AND SCOPE	5
I.3 CURRENT ENVIRONMENT	5
I.4 BUSINESS CASE PROCESS	5
JUSTIFICATION AND OTHER INFORMATION	6
II.1 JUSTIFICATION	6
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II.3 ACQUISITION STRATEGY	6
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II.4.1 Adherence to Architecture and Infrastructure Standards	6
II.4.2 Security	6
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II.5.1 Rationale for Conducting this Business Case	7
II.5.2 Methodology	7
II.5.3 The Alternatives	7
II.5.4 Cost Analysis	8
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II.5.6 Benefit to Cost Analysis	9
II.5.7 Risk Analysis	9
II.6 RECOMMENDED ALTERNATIVE	10
ACTIONS REQUIRED TO IMPLEMENT THE SELECTED ALTERNATIVES	11

Illustrative examples follow... 21



How Do You Know If Your Program is Truly Open?

ILLUSTRATIVE EXAMPLES

YES

NO

- For components which are expected to evolve to meet new or unforeseen performance requirements, does the Navy have exclusive ownership of any software or documentation being developed or used to build the system? ✓
- Are proprietary components well defined, limited in scope, and designed so that others are not precluded from interfacing with the component or other parts of the system? ✓
- Are your program's design artifacts disclosed "early and often" and freely available for re-use by another program or third parties? ✓
- Does the program use widely-accepted and supported standards to define interface definitions or key interfaces that are published and maintained by recognized organizations? ✓
- Does your program encourage continuous competition for components, modules, and tasks? Is it easy for your follow on contract to go to anyone other than the incumbent? ✓



How Do You Know If Your Program is Truly Open?

ILLUSTRATIVE EXAMPLES

YES

NO

- Does your program utilize commodity products (i.e. COTS products with a large user base)? ✓
- Does your program use modules or components that are also being used by other programs with different product vendors? ✓
- Does your program use an integrated team approach to identify how changes affect the system? ✓
- Is the infrastructure of your system open? (Operating System, Data Bases, Communications, Interfaces, Tools) ✓
- Does porting to a new hardware platform require minimal time and resources? ✓



Moving forward, we expect Industry to fully participate in the success of the OA initiative

- Work with your program offices to assess the openness of the program
- Compare RFIs and RFPs against questions in the OA Assessment Tool and provide feedback during the solicitation period
- Help us improve the OA Assessment Model and OA Assessment Tool through the feedback system at <https://acc.dau.mil/oa>
- Educate your business and technical employees on the OA initiative
- Provide input on OA success stories and lessons learned in implementing OA at <https://acc.dau.mil/oa>



We must continually build off lessons learned in the past

OA LESSONS LEARNED

- Establish enterprise Communities of Interest (COIs)
 - Base COIs on mission areas – Strike, ISR, AAW, ASW etc.
 - Include the warfighter at EVERY step
 - Plan for enterprise-wide reuse of government owned software
 - Use MOSA principles - modular design, open standards, key interfaces
 - Incentivize Program Managers for enterprise vice platform/program success
 - Use Business Case Analyses to determine OA priorities
- Contracts
 - Incentivize cooperation among integrators & developers
 - Develop award fees based on group success
 - Maintain continuous competition for application development
 - Conduct independent peer review of products using real data
 - Ensure data rights support open architecture and 3rd party use
 - Full disclosure – Early and Often



Questions?



Today's Agenda

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The Open Architecture Enterprise Team Points of Contact

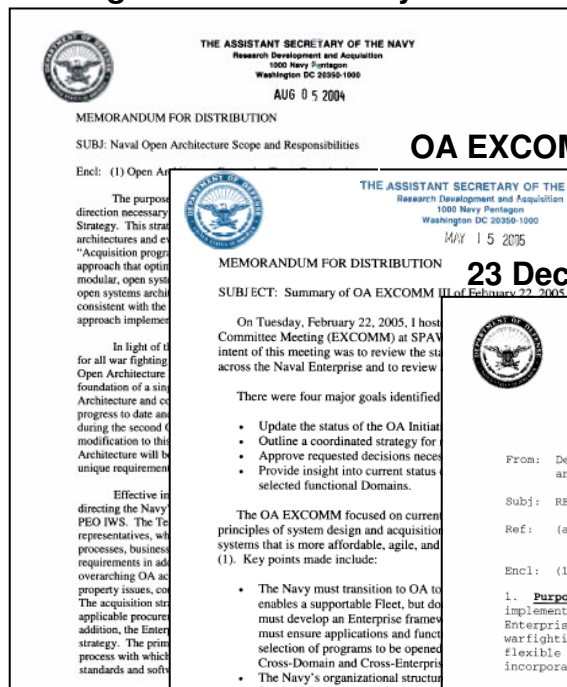
ENTERPRISE		
Bill Johnson	Enterprise Lead	william.m.johnson4@navy.mil
LCDR Corsano	Enterprise Representative	Scott.Corsano@navy.mil
AIR DOMAIN		
Mark Milton	Air Domain Lead	mark.milton@navy.mil
Brian Schneider	Air Domain Representative	brian.schneider@jhuapl.edu
C4I DOMAIN		
Chris Miller	C4I Domain Lead	chris.miller@navy.mil
Dave Gedra	C4I Domain Representative	dgedra@systechnologies.com
MARINE CORP DOMAIN		
Tom Irwin	Marine Corp Lead	thomas.c.irwin@usmc.mil
Jim Africa	Marine Corp Representative	james.africa@navy.mil
SPACE DOMAIN		
Brian Scurry	Space Domain Lead	bryan.scurry@navy.mil
Carlos Del Toro	Space Domain Representative	cdeltoro@sbgtechnologiesolutions.com
SUB DOMAIN		
LCDR Christiansen	Sub Domain Lead	ChristensenKS@NAVSEA.navy.mil
Paul Gooder	Sub Domain Representative	pgooder@egginc.com
SURFACE DOMAIN		
CDR Ailes	Surface Domain Lead	john.ailes@navy.mil
Aaron Anderson	Surface Domain Representative	aaron.s.anderson@navy.mil



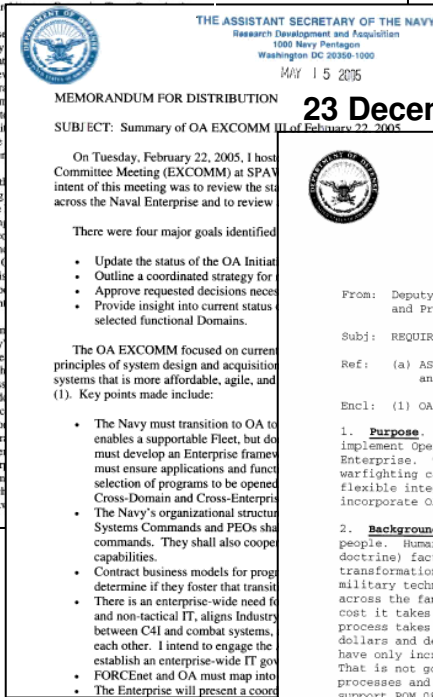


Naval OA requirements and program responsibilities are derived from three primary sources

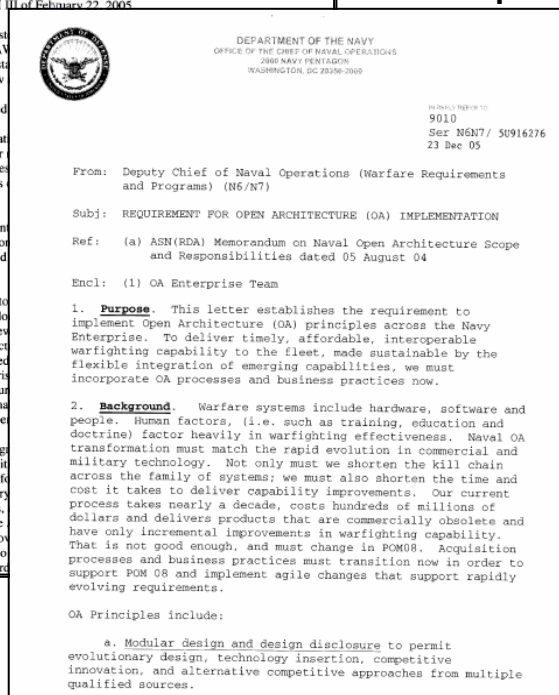
5 August 2004 OA Policy Statement



OA EXCOMM Action Items



23 December 2005 OPNAV Requirements



ASN RD&A OA Policy

OA EXCOMM Action Items

OPNAV Requirements

NAVAL OA Responsibilities and Requirements to execute against the strategy



OA Special Interest Area - <https://acc.dau.mil/oa>

Acquisition Community Connection
Where the AT&L Workforce Meets to Share Knowledge

Defense Acquisition University

Home | DAU Resources | Contact Us | Site Map | Help Search

acc > special interest areas > naval enterprise open architecture >

Naval Enterprise Open Architecture

The homepage for Navy acquisition professionals, industry, academia, and others interested in Naval Open Architecture.

ID: 77635

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YOU ARE GUEST (READ) EST

LOGIN

Username

Password

Limited access is available for CoPs & SIAs without login

LOGIN

Join

PARTICIPATE

Options for this Topic

E-mail this Page

PEOPLE

MOST VISITED (LAST 12 MONTHS)

Monthly average hits ~ 1200



Education and Training Master Plan



NPS / AFIT/ Civilian Universities

Postgraduate Education

- High Impact
- Long time horizon
- Develops leaders of tomorrow
- Technical competencies
- Some business competency
- In-depth education in technical or business disciplines leading to a graduate degree
- Formal classroom training, either on campus or distance learning

DAWIA Certification Training

- High Impact
- Long Time Horizon
- Qualification training for the Acquisition Workforce
- Principally business competencies
- Some technical competencies
- Broad training covering a variety of topics leading to career field certifications in specific disciplines
- Formal classroom training either on campus or distance learning

DAU

NAVY

Continuous Learning

- Medium Impact
- Short to medium time horizon
- Business or technical competencies
- Focused course work on specific topics
- Symposia and professional society meetings
- Instructor or web delivery

Knowledge Sharing

- Medium to high impact
- Short time horizon
- Task based
- Web based
- Learning modules or best practices

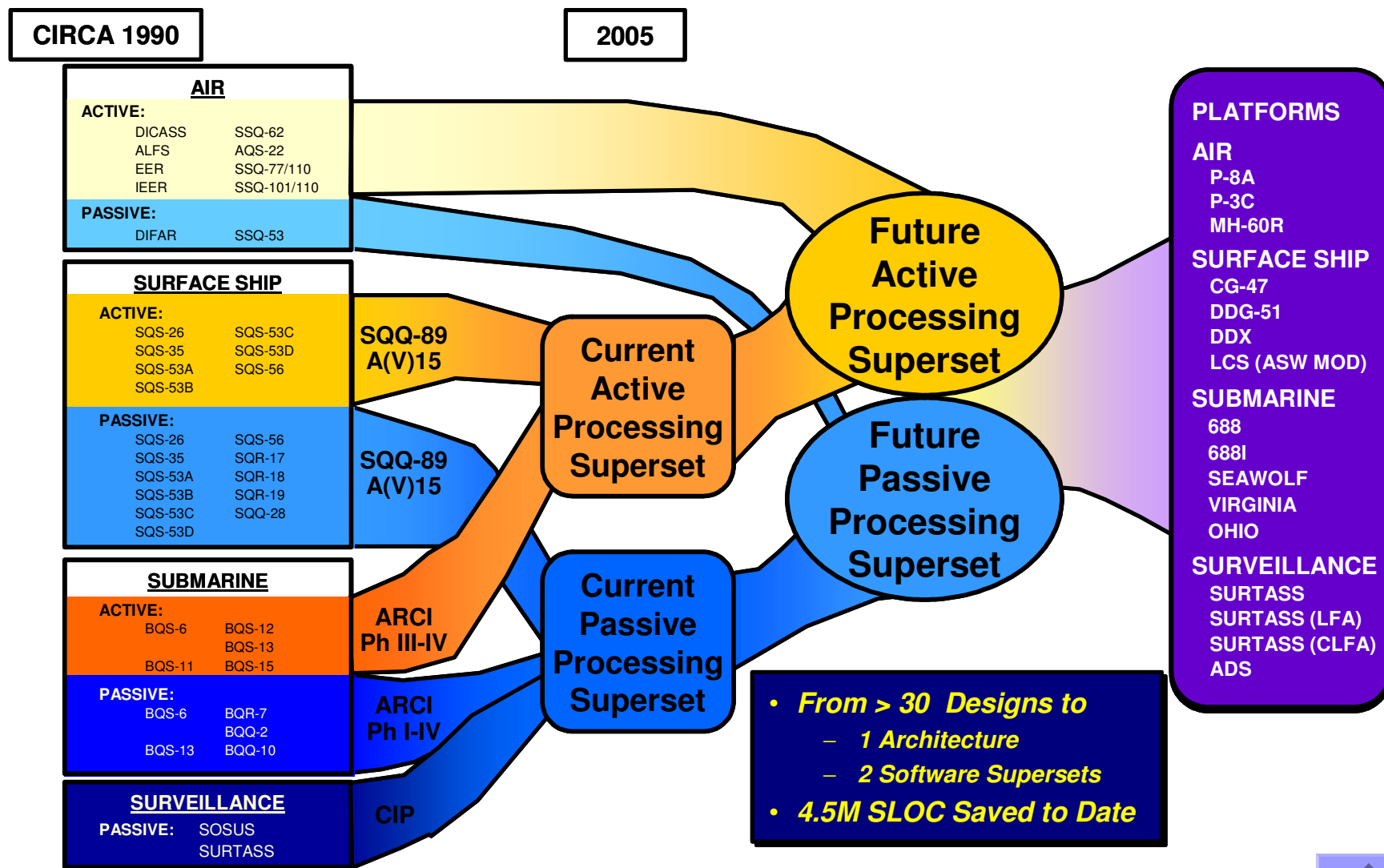
Workforce Awareness

- Low Impact
- Short time horizon
- Business orientation
- Briefings and general orientation
- Instructor or web delivery



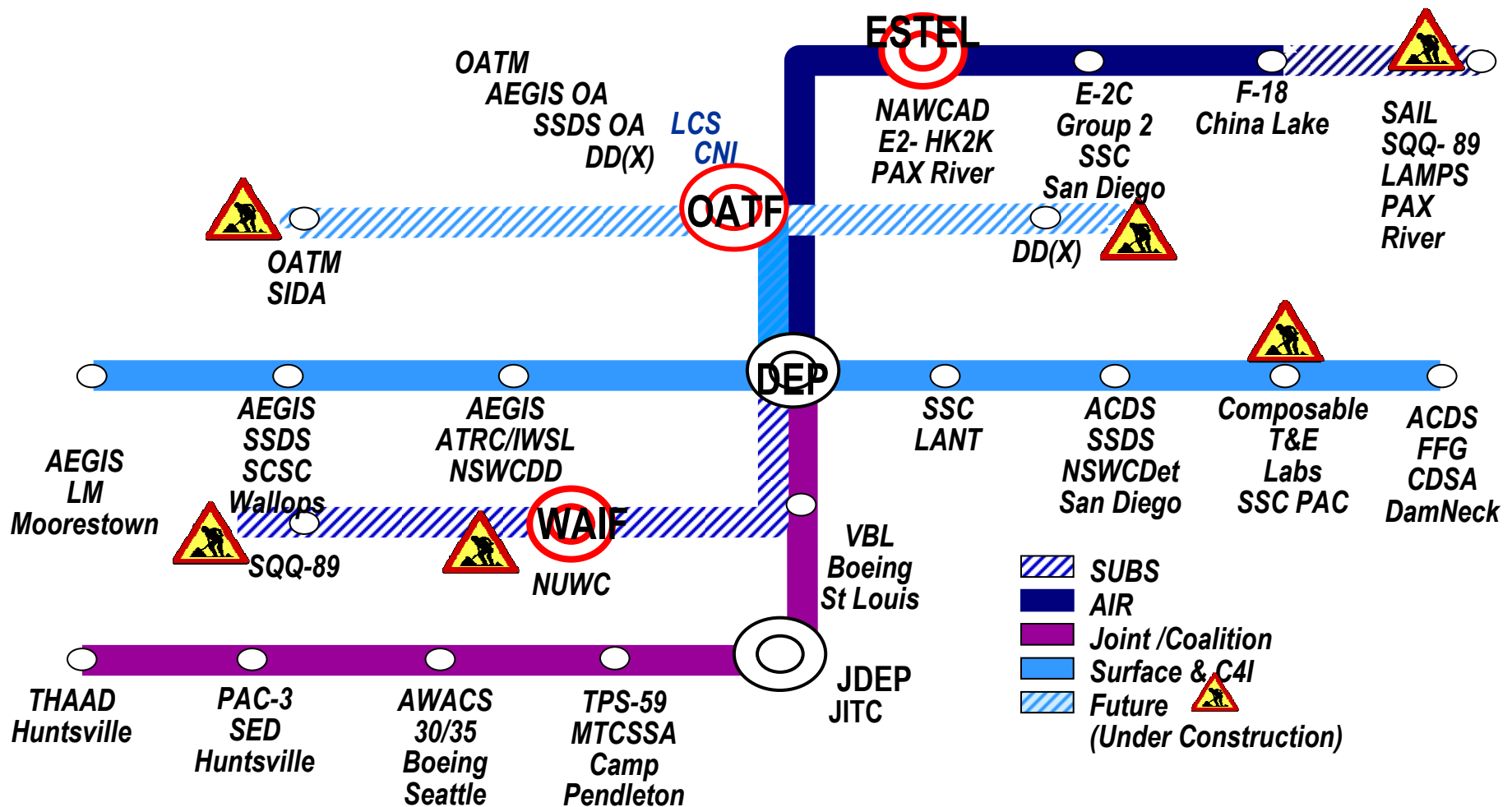


Enterprise Opportunities – ASW Common Software / Architecture





Alternatives are being tested to support OA implementation through existing facilities



Transformation Through Collaboration



Technical goals and experiment design criteria have been developed to measure success

Possible Goals	Technology Evaluation	Systems Development	Military Utility
Fundamental Question	<i>Does technology improve interoperability?</i>	<i>How does interoperability enable new systems?</i>	<i>What is the value of interoperability?</i>
Measure of Success	Component performance	System performance	System effectiveness
Experiment Design Criteria	How will the technology facilitate integration across systems and domains to address capability gaps?	What are the interoperability or OA implementation issues to be examined?	What warfighting improvements will be measured in this experiment?

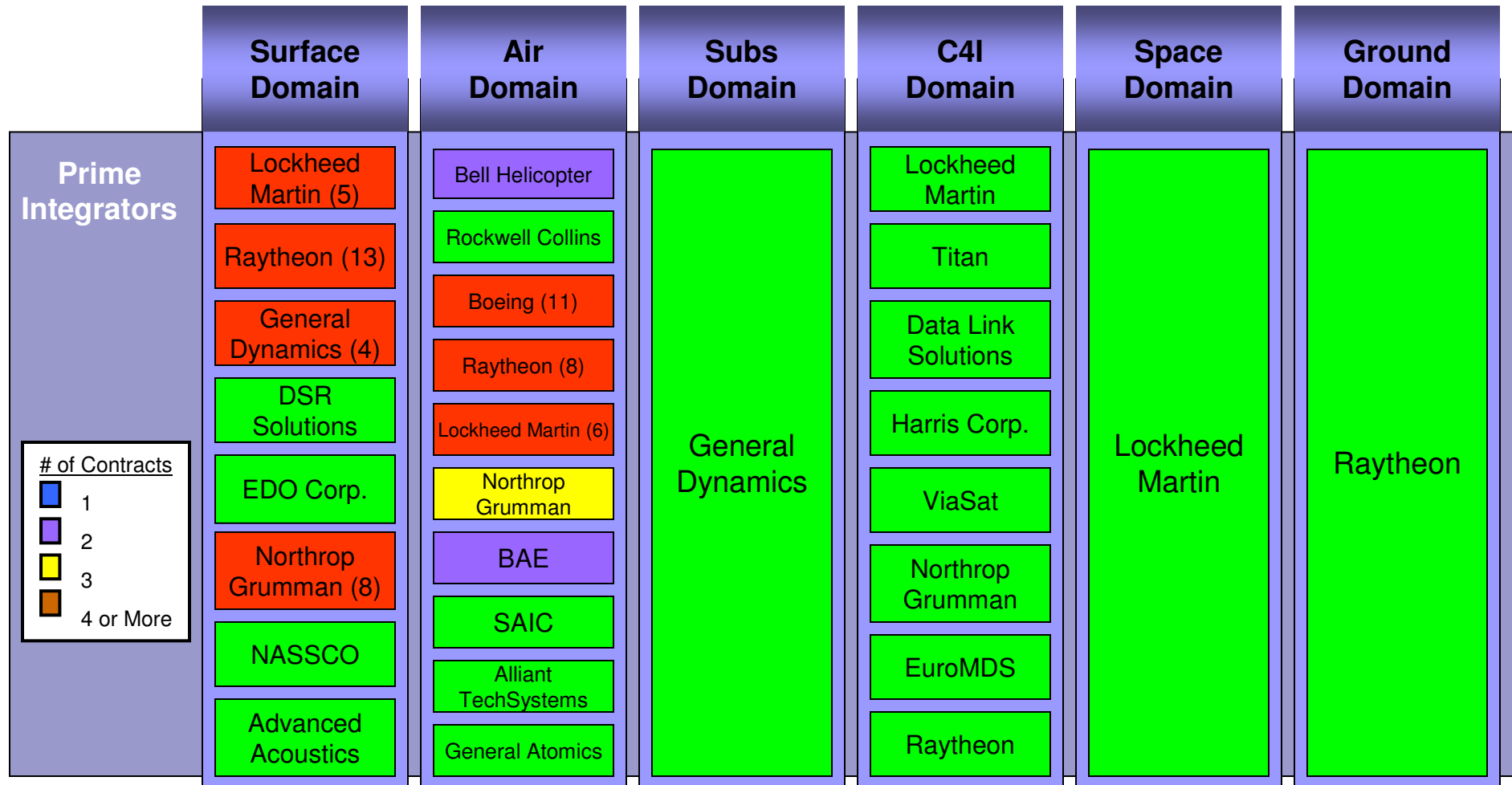
Identifying technical goals will lead to actionable experiment design criteria

<u>Domains' Criteria</u>	<u>Component Technologies</u>	<u>Integration Challenges</u>	
Is it OA? Is it Fn? Is it feasible? Is it relevant?	IPv6 QoS Security Sys Mgmt Policy Timing Look-up Services Dynamic Resource Mgmt	Joint Track Manager UDOP/COTP Real-Time Fusion Engine Common Data Model	Military utility helps compare cost and performance for new systems





Enterprise Overview of Prime Integrators and Contracts



Note: This represents data on ACAT I and II programs collected per an EXCOMM action item.





Example Contract Language – Section C

1. **Open Architecture** – Incorporates portability, maintainability, interoperability, upgradeability, transportability, and long-term supportability. Modular and layered. Maximize COTS/NDI hardware, operating systems, and middleware.
2. **Open Modular Design** – Modules shall consist of components that are self-contained elements with well-defined interfaces. Contractors will provide the rationale for the modularization choices made to generate the design and shall explicitly address any tradeoffs performed, particularly those that compromise the modular and open nature of the system. Designs shall be documented and modeled using industry standard formats and tools that can export information in a standard format.
3. **Interface Design and Management** – Clearly define the component and system interfaces. Define and document all subsystem and configuration item level interfaces to provide full functional, physical, and electrical specifications.
4. **Treatment of Proprietary Elements** – Identify and justify the use of proprietary or closed interfaces, code modules, hardware, firmware or software. For those portions of interfaces, hardware, firmware or modules that are proprietary, the Contractor shall employ hardware and/or software partitioning or other design techniques to isolate the proprietary portions from the rest of the system. It is the contractor's responsibility to protect the open elements of the system from being intertwined with the proprietary elements.



Example Contract Language - Section C

5. **Open Business Practices.** The Contractor shall demonstrate that the modularity of the system design promotes the identification of multiple sources of supply and/or repair, and supports flexible business strategies that enhance subcontractor competition. The contractor shall identify any known alternatives for solutions the Contractor has proposed to custom build. The contractor shall identify those pre-existing items it intends to reuse. If the Government has identified a component or components that can be reused in the system design, the Contractor must justify (by cost, schedule, compatibility, etc.) any exceptions to this proposed reuse to the Government's satisfaction. The general objective of these efforts shall be the development of common system and/or common elements or components which meet the performance requirements of the various U.S. Navy platform missions, where commonality offers the greatest cost and technical benefits.
6. **Peer Review Rights.** The government intends to procure open architectures, designs, and corresponding software components. For designs or software the Government has GPR, the Government intends to receive third party reviews on an ongoing basis. Proprietary elements, that the Government has approved into open designs and code, will not be subject to this review.



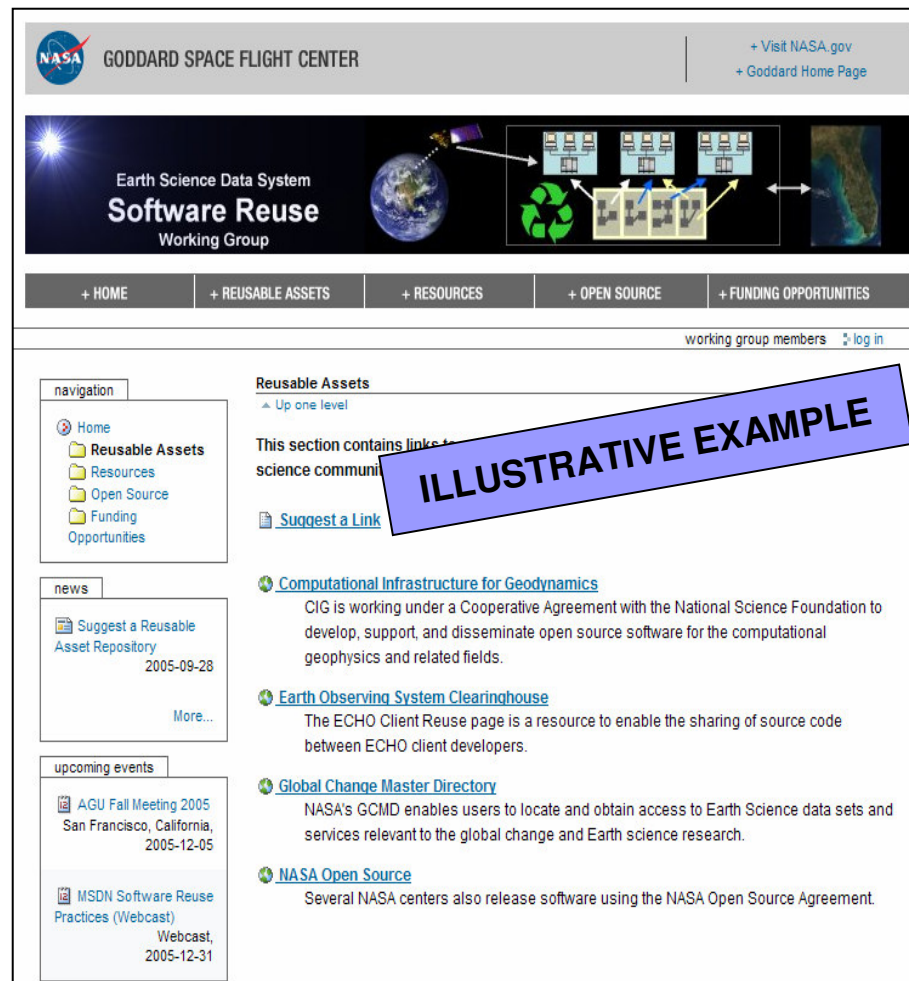
Example Contract Language - Section C

7. **Technical Insertion Method** - The Contractor's architectural approach shall provide a viable technology insertion and refresh process.
8. In accomplishing the above, the Contractor shall use the following standards in descending order of importance:
 - ☐ Standards as specified within the contract
 - ☐ Commercial standards
 - ☐ Standards that are developed by international or national industry standards bodies that have been widely adopted by industry
 - ☐ Standards that are adopted by industry consensus-based standard bodies and have been widely adopted in the market place
 - ☐ De facto standards (those widely adopted & supported in the market place)
 - ☐ Standards that are not specified within this contract must be approved by the Government prior to use





Enterprise Component Library



Purpose

- Establish a Naval Enterprise OA Software Re-Use Library
- Establish configuration management processes and business rules to maintain the library

